

## **REMARKS**

Applicant wishes to thank the Examiner for the attention accorded to the instant application, and respectfully requests reconsideration of the application as amended.

### **Withdrawal of the Previously Proposed But Rejected Amendments**

Applicant has previously filed a Response under 37 CFR § 1.116 on September 12, 2007 with proposed claim amendments. However, applicant hereby withdraws the previous § 1.116 Amendment and requests that this amendment submitted under 37 CFR § 1.114 along with a Request for Continued Examination (RCE) be entered and the examination of the application be continued.

### **Formal Matters**

In this amendment, claims 1-20 are pending and claims 1, 11 and 12 are amended. Claims 1 and 11 are amended to more clearly recite the invention, and claim 12 is amended to make a minor editorial corrections. Specifically, claims 1 and 11 are amended to recite that the hit predicting unit stores history information indicating whether a hit or a miss has been found for each access to each bank. Support for this amendment can be found in the original specification on page 14, lines 4-10.

### **Specification**

Applicant appreciates that the requirement for a substitute specification has been withdrawn. However, in accordance with the Examiner's requirement that errors in English idiom, grammar and punctuation in the substitute specification be corrected, applicant amends portions of the specification as follows. The six paragraphs beginning on page 1, line 23, the paragraph beginning on page 3, line 8, the two paragraphs beginning on page 3, line 18, the paragraph beginning on page 11,

line 16, the three paragraphs beginning on page 12, line 3, the paragraph beginning on page 13, line 10, the paragraph beginning on page 13, line 24, the two paragraphs beginning on page 14, line 1, the two paragraphs beginning on page 15, line 7, the two paragraphs beginning on page 16, line 3, the two paragraphs beginning on page 16, line 28, the paragraph beginning on page 17, line 26, the three paragraphs beginning on page 19, line 15, the paragraph beginning on page 20, line 20, the paragraph beginning on page 21, line 2, the paragraph beginning on page 21, line 14, the two paragraphs beginning on page 23, line 4, the two paragraphs beginning on page 25, line 20, the paragraph beginning on page 27, line 23, the paragraph beginning on page 28, line 10 and the paragraph beginning on page 31, line 3 are amended.

**Rejection of Claims under 35 U.S.C. §112**

Claims 12 and 17 are rejected under 35 U.S.C. §112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 12 is amended to replace “memory access control unit” with “memory access control device” for which there is antecedent basis in claim 11. This amendment provides proper antecedent basis for the memory access control device recited in claim 17. Applicant appreciates that, according to the Advisory Action mailed September 19, 2007, this rejection will be withdrawn when the amendment is entered.

**Rejection of Claim 1 Under 35 U.S.C. §102**

The Examiner has rejected claim 1 under 35 U.S.C. §102(b) as clearly anticipated by Farrell, U.S. Patent No. 5,665,153. This rejection should be withdrawn based on the comments and remarks herein.

Applicant's claimed invention fulfills the need for a memory access control device capable of enhancing memory access efficiency by predicting, based on prior accesses to each bank, whether a hit is found in a subsequent access, and closing or not closing a memory bank after completing present access based on the prediction. The prediction is based on history information, that is, the result from asserting signals corresponding to the number of recent times of assertion of the hit signals or the miss signals for each bank. Independent claim 1 recites "when a hit predicting unit predicts a hit based on the history information, said memory control unit terminates a routine without closing a bank at a time of completion of present access operations and, when said hit predicting unit predicts a miss based on the history information, said memory control unit closes said bank at the time of completion of present access operations and terminates the routine".

Farrell does not disclose or suggest storing whether a hit or a miss has been found for accesses to each bank in memory as history information and then predicting a hit or a miss based on this history information. Instead, Farrell discloses that when writing a computer program that accesses a page of memory, a programmer may know whether the next memory access is likely to be in the same page of memory, and accordingly may program instructions that indicate whether the next access is likely to be in the same page of memory. When these instructions are assembled, the programmer puts page control

information in an unused high order address bit of the memory access. When the program is executed, a memory controller in the system executing the program reads this page control bit and determines whether to close the page after access or leave it open for the next access bit (abstract). Hence, Farrell discloses a memory controller in which hard-wired circuitry, not history information, determines whether the next access is likely to be a different page of memory or the same page of memory. Based on this determination, the memory state flow diagram proceeds either to open page idle block or to close the current page and proceed to an idle block. Farrell does not disclose or suggest that the memory controller terminates a routine and closes or does not close a memory bank based on a prediction, using stored history information, of a hit predicting unit.

In contrast, the claimed invention has as a main feature that a hit predicting unit predicts whether or not a next access to each bank in memory will be directed to a same page, based on stored history information of accesses to each bank in memory.

It has been held by the courts that “Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim.” *Lindemann Maschinenfabrik GMBH v. American Hoist and Derrick Company et al.*, 730 F.2d 1452, 221 USPQ 481 (Fed. Cir. 1984). As illustrated above, Farrell does not disclose suggest a hit predicting unit that stores as history information whether a hit or a miss has been found for a natural number of times of accesses to each bank in memory, so that Farrell does not disclose every feature of the invention as recited in independent claim 1. Accordingly, this rejection should be withdrawn.

### **Rejection of Claim 11 Under 35 U.S.C. §103**

The Examiner has rejected claim 11 under 35 U.S.C. §103(a) as unpatentable over Farrell, U.S. Patent No. 5,665,153. This rejection should be withdrawn based on the comments and remarks herein.

As discussed above, Farrell does not disclose or suggest a hit predicting unit that stores as history information whether a hit or a miss has been found for a natural number of times of accesses to each bank in memory, but instead teaches that a programmer may program instructions that indicate whether the next access is likely to be in the same page of memory.

It has been held by the courts that to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. See, *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). As illustrated above, Farrell does not disclose or suggest a hit predicting unit storing history information and predicting a hit or a miss based on this stored information, and does not disclose or suggest each and every feature of the present invention as recited in the independent claims, so that *prima facie* obviousness has not been established. Thus, claim 11 is patentably distinguishable over the art of record in the application. Hence, this rejection should be withdrawn.

### **Allowable Subject Matter**

Applicant appreciates that claims 2-10 and 13-20 would be allowable if rewritten in independent form. For the reasons discussed above, applicant submits that claims 1 and 11 are allowable so that claims 2-10, which depend from claim 1, and claims 13-20, which depend from claim 11, are allowable as written.

Conclusion

For at least the reasons set forth in the foregoing discussion, Applicant believes that the Application is now allowable, and respectfully requests that the Examiner reconsider the rejection and allow the Application. Should the Examiner have any questions regarding this Amendment, or regarding the Application generally, the Examiner is invited to telephone the undersigned attorney.

Respectfully submitted,



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